

Remarks

Claims 1-20 were originally filed in this application.

Without prejudice or disclaimer, claims 9-20 were previously withdrawn from consideration as being drawn to non-elected inventions.

Dependent claims 2 and 6 are currently canceled without prejudice or disclaimer.

Dependent claims 21 and 22 are currently added without introducing new matter. Support for the respective subject matter of each of these claims can be found throughout the present specification, claims and drawings as originally filed. For example, the present specification at pages 9 and 10, with reference to FIG. 3, discusses water from a storage vessel 12 into a device 100, and produced water from device 100 directed into vessel 12.

Independent claim 1 is currently amended to clarify an aspect of the invention. Dependent claims 3 and 7 are currently amended to correct their respective dependencies. No new matter is introduced with these amendments.

As a result, claims 1, 3-5, 7-8, and 21-22 are pending for examination, with claims 1 and 5 being in independent form.

Rejections under 35 U.S.C. § 103

Claims 1-8 were rejected under 35 U.S.C. § 103(a) as would have been obvious over the disclosure of Tessier et al. in U.S. Patent No. 6,149,788 (hereinafter "Tessier et al.") in view of the disclosure of Deguchi et al. in U.S. Patent No. 6,344,122 (hereinafter "Deguchi et al.")

Applicants disagree that the respective subject matter of independent claims 1 and 5 would have been obvious over the disclosures of Tessier et al. and Deguchi et al.

Tessier et al. disclose a method and apparatus for preventing scaling in electrodeionization units by inhibiting precipitation of scale-forming metallic

cations contained in the feed water and thereby increasing efficiencies thereof. (Tessier et al. at Abstract.) In particular, scale on anion exchange membranes of the apparatus can be prevented by introducing water or aqueous solution into the concentrating compartment of the apparatus in an opposite direction relative to water being purified in the diluting compartment of the apparatus. In FIG. 2 (reproduced below), Tessier et al. disclose that a supply stream into the electrode compartments comprises a bleed from a discharge stream 50 from a diluting compartment 32 of the apparatus. (Tessier et al. at FIG. 2 and at column 5, lines 41 et seq.) Tessier et al., however, emphasize that because the discharge stream 50 comprises water purified by the electrodeionization unit 10, the dissolved salt concentration of the discharge stream 50 is substantially non-existent and such water if left untreated, would be highly resistant to current flow therethrough. (Tessier et al. at column 5, lines 48-52.) Tessier et al. thus explain that to mitigate this problem, saline solution is injected into the supply stream to increase the conductivity thereof, which can involve injecting a solution of an inert salt from storage vessel 45, such as sodium chloride or potassium chloride, by means of a metering pump 47. (Tessier et al. at column 5, lines 53-59.) Because Tessier et al. teach adding ionized species into the aqueous stream introduced into the cathode compartment, hydrogen (H_2) cannot form and reduce the stream corrosivity. (See Bianchi et al., U.S. Patent No. 4,830,721, at column 3, lines 67 et seq; teaching that deionized water is required to produce H_2 .) Indeed, Tessier et al. relies on the ionic species in the cathode compartment to prevent scale formation by ionizing hydrogen ions (H^+) and hydroxyl ions (OH^-), rather than H_2 . (See Tessier et al. at column 4, lines 62 et seq.) Because Tessier et al. require a conductive aqueous stream in the cathode compartment, the cited reference cannot reduce corrosivity of the stream passed therethrough. Thus, Tessier et al. cannot produce a water stream having less corrosivity by passing it through a cathode compartment by, for example, generating H_2 therein.

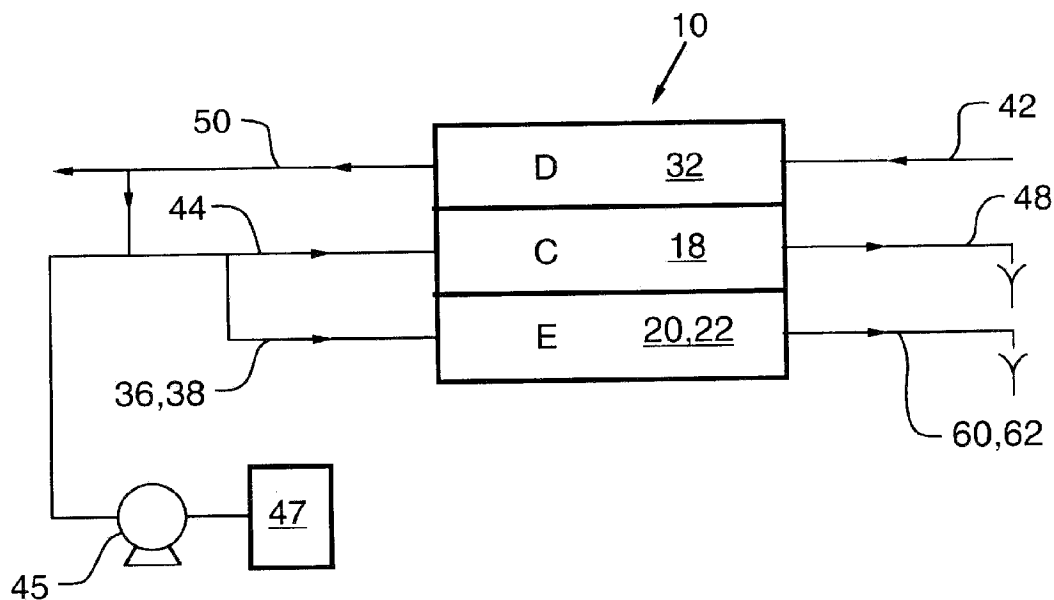


FIG.2

Deguchi et al. disclose an electrodeionization apparatus with an anode and a cathode, as well as cation-exchange membranes and anion-exchange membranes alternately arranged therebetween. (Deguchi et al. at Abstract.) Deguchi et al. do not disclose passing a water stream from a depleting compartment into a cathode compartment of an electrochemical device. Significantly, Deguchi et al. do not disclose reducing corrosivity of a water stream by passing it through a cathode compartment of an electrochemical device.

Accordingly, because Tessier et al. and Deguchi et al. fail to teach a method of providing water comprising passing a first water stream through a depleting compartment of an electrochemical device to produce a second water stream having an LSI (Langelier Saturation Index) of less than about 0, and passing the second water stream through a cathode compartment of the electrochemical device to produce a third water stream, which is less corrosive than the second water stream, and having an LSI of less than about 0; the prima facie case of obviousness is improper as failing to disclose an alleged combination having each and every limitation in the manner recited in independent claim 1.

Dependent claims 3-4 and newly presented dependent claim 21, each of which depend ultimately from independent claim 1, would also not have been obvious over Tessier et al. in view of Deguchi et al. for at least the same reasons noted above.

Independent claim 5 would also not have been obvious over Tessier et al. in view of Deguchi et al. As noted, Tessier et al. disclose passing a portion of the treated water from the depleting compartment into the cathode compartment. Tessier et al., however, do not disclose passing less corrosive water from the cathode compartment into the depleting compartment. Rather, Tessier et al. disclose discharging stream 48. (Tessier et al. at column 4, lines 55 et seq.)

Deguchi et al. also fail to disclose passing water from the cathode compartment into a depleting compartment.

Therefore, the prima facie case of obviousness as to independent claim 5 is also improper because any alleged combination of Tessier et al. and Deguchi et al. would fail to disclose each and every limitation in the manner recited.

Dependent claims 7-8 and newly presented dependent claim 22, each of which depend ultimately from independent claim 5, would also not have been obvious over Tessier et al. in view of Deguchi et al. for at least the same reasons noted above.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103 is respectfully requested.

New Claims

New dependent claims 21 and 22 respectively depend directly or indirectly from independent claims 1 or 5. The respective subject matter of each of these dependent claims, which is directed a feature of the invention, is patentable for at least the reasons noted herein.

Conclusion

In view of the foregoing Amendments and Remarks, this application is in condition for allowance; a notice to this effect is respectfully requested. If the Examiner believes, that the application is not in condition for allowance, the Examiner is requested to call Applicants' attorney at the telephone number listed below.

If this Response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this Response, including an extension fee, please charge any deficiency to Deposit Account No. 50/2762.

Favorable action is hereby requested. Should any questions arise concerning the foregoing, please contact the undersigned at the telephone number listed below.

Respectfully submitted,
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